SEQUENCE LISTING

<110> Jones, Kenneth A.
Walker, Mary W.
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Gerald, Christophe P.G.

<120> Chimeric G-Proteins And Uses Thereof

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<213> C. elegans

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Phe Ile Lys Gln Met Arg Ile Ile His Gly Gln Gly Tyr Ser Glu Glu 50 55 60

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Arg Glu Tyr Gln Leu Thr Asp Ser Ala Lys Tyr Tyr Leu Ser Asp Leu 145 150 155 160

Arg Arg Leu Ala Val Pro Asp Tyr Leu Pro Thr Glu Gln Asp Ile Leu 165 170 175

Arg Val Arg Val Pro Thr Thr Gly Ile Ile Glu Tyr Pro Phe Asp Leu 180 185 190

Glu Gln Ile Ile Phe Arg Met Val Asp Val Gly Gln Arg Ser Glu
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225 230 235 240

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Pro Glu Tyr Asp Gly Pro Pro Arg Asp Pro Ile Ala Ala Arg Glu Phe 290 295 300

Ile Leu Lys Met Phe Val Asp Leu Asn Pro Asp Ala Asp Lys Ile Ile 305 310 315 320

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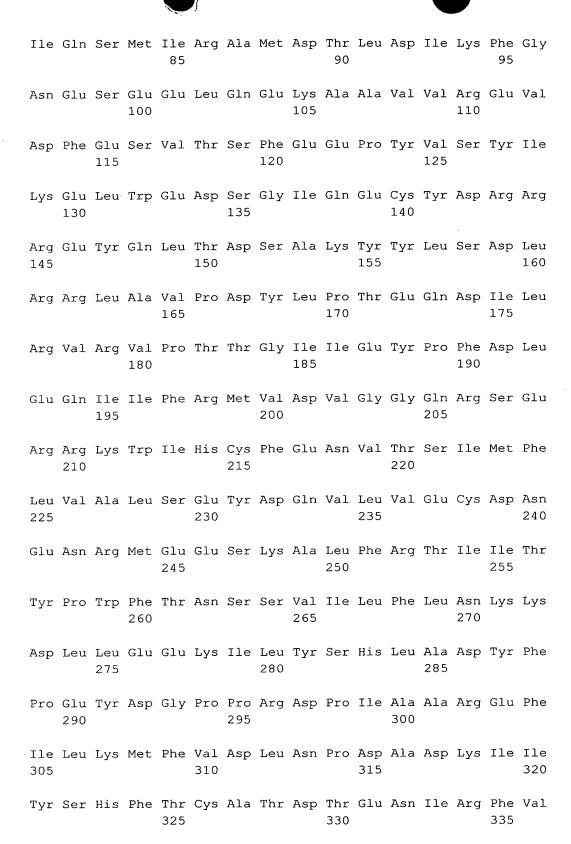
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Arg Arg Leu Ala Val Pro Asp Tyr Leu Pro Thr Glu Gln Asp Ile Leu 165 170 175

Arg Val Arg Val Pro Thr Thr Gly Ile Ile Glu Tyr Pro Phe Asp Leu 180 185 190



Glu Gln Ile Ile Phe Arg Met Val Asp Val Gly Gln Arg Ser Glu 195 200 205

Arg Arg Lys Trp Ile His Cys Phe Glu Asn Val Thr Ser Ile Met Phe 210 215 220

Leu Val Ala Leu Ser Glu Tyr Asp Gln Val Leu Val Glu Cys Asp Asn 225 230 235 240

Glu Asn Arg Met Glu Glu Ser Lys Ala Leu Phe Arg Thr Ile Ile Thr 245 250 255

Tyr Pro Trp Phe Thr Asn Ser Ser Val Ile Leu Phe Leu Asn Lys Lys 260 265 270

Asp Leu Leu Glu Glu Lys Ile Leu Tyr Ser His Leu Ala Asp Tyr Phe 275 280 285

Pro Glu Tyr Asp Gly Pro Pro Arg Asp Pro Ile Ala Ala Arg Glu Phe 290 295 300

Ile Leu Lys Met Phe Val Asp Leu Asn Pro Asp Ala Asp Lys Ile Ile 305 310 315 320

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<213> C. elegans

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35 40 45

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Asp 65	Lys	Arg	Ala	His	Ile 70	Arg	Leu	Val	Tyr	Gln 75	Asn	Val	Phe	Met	Ala 80
Ile	Gln	Ser	Met	Ile 85	Arg	Ala	Met	Asp	Thr 90	Leu	Asp	Ile	Lys	Phe 95	Gly
Asn	Glu	Ser	Glu 100	Glu	Leu	Gln	Glu	Lys 105	Ala	Ala	Val	Val	Arg 110	Glu	Val
Asp	Phe	Glu 115	Ser	Val	Thr	Ser	Phe 120	Glu	Glu	Pro	Tyr	Val 125	Ser	Tyr	Ile
Lys	Glu 130	Leu	Trp	Glu	Asp	Ser 135	Gly	Ile	Gln	Glu	Cys 140	Tyr	Asp	Arg	Arç
Arg 145	Glu	Tyr	Gln	Leu	Thr 150	Asp	Ser	Ala	Lys	Tyr 155	Tyr	Leu	Ser	Asp	Leu 160
Arg	Arg	Leu	Ala	Val 165	Pro	Asp	Tyr	Leu	Pro 170	Thr	Glu	Gln	Asp	Ile 175	Leu
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Glu	Gln	Ile 195	Ile	Phe	Arg	Met	Val 200	Asp	Val	Gly	Gly	Gln 205	Arg	Ser	Glu
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Leu 225	Val	Ala	Leu	Ser	Glu 230	Tyr	Asp	Gln	Val	Leu 235	Val	Glu	Cys	Asp	Asr 240
Glu	Asn	Arg	Met	Glu 245	Glu	Ser	Lys	Ala	Leu 250	Phe	Arg	Thr	Ile	Ile 255	Thr
Tyr	Pro	Trp	Phe 260	Thr	Asn	Ser	Ser	Val 265	Ile	Leu	Phe	Leu	Asn 270	Lys	Lys
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290 295 300

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<213> Homo sapiens

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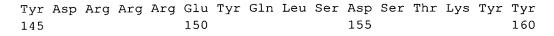
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Val Arg Glu Val Asp Val Glu Lys Val Ser Ala Phe Glu Asn Pro Tyr 115 120 125

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Gln Asp Val Leu Arg Val Arg Val Pro Thr Thr Gly Ile Ile Glu Tyr 180 185 190

Pro Phe Asp Leu Gln Ser Val Ile Phe Arg Met Val Asp Val Gly 195 200 205

Gln Arg Ser Glu Arg Arg Lys Trp Ile His Cys Phe Glu Asn Val Thr 210 215 220

Ser Ile Met Phe Leu Val Ala Leu Ser Glu Tyr Asp Gln Val Leu Val 225 230 235 240

Glu Ser Asp Asn Glu Asn Arg Met Glu Glu Ser Lys Ala Leu Phe Arg 245 250 255

Thr Ile Ile Thr Tyr Pro Trp Phe Gln Asn Ser Ser Val Ile Leu Phe 260 265 270

Leu Asn Lys Lys Asp Leu Leu Glu Glu Lys Ile Met Tyr Ser His Leu 275 280 285

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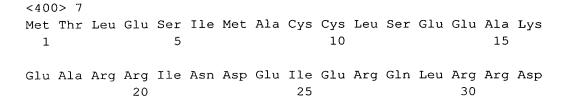
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<211> 359

<212> PRT

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Gln Asn Ile Phe Thr Ala Met Gln Ala Met Ile Arg Ala Met Asp Thr \$85\$ 90 95

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Val Arg Glu Val Asp Val Glu Lys Val Ser Ala Phe Glu Asn Pro Tyr 115 120 125

Val Asp Ala Ile Lys Ser Leu Trp Asn Asp Pro Gly Ile Gln Glu Cys 130 135 140

Tyr Asp Arg Arg Glu Tyr Gln Leu Ser Asp Ser Thr Lys Tyr Tyr 145 150 155 160

Leu Asn Asp Leu Asp Arg Val Ala Asp Pro Ala Tyr Leu Pro Thr Gln
165 170 175

Gln Asp Val Leu Arg Val Arg Val Pro Thr Thr Gly Ile Ile Glu Tyr 180 185 190

Pro Phe Asp Leu Gln Ser Val Ile Phe Arg Met Val Asp Val Gly Gly 195 200 205

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Glu Ser Asp Asn Glu Asn Arg Met Glu Glu Ser Lys Ala Leu Phe Arg 245 250 255 Thr Ile Ile Thr Tyr Pro Trp Phe Gln Asn Ser Ser Val Ile Leu Phe 260 265 270

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Ala Arg Glu Phe Ile Leu Lys Met Phe Val Asp Leu Asn Pro Asp Ser 305 310. 315 320

Asp Lys Ile Ile Tyr Ser His Phe Thr Cys Ala Thr Asp Thr Glu Asn 325 330 335

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Glu Ser Gly Lys Ser Thr Phe Ile Lys Gln Met Arg Ile Ile His Gly 50 55 60

Ser Gly Tyr Ser Asp Glu Asp Lys Arg Gly Phe Thr Lys Leu Val Tyr
65 70 75 80

Gln Asn Ile Phe Thr Ala Met Gln Ala Met Ile Arg Ala Met Asp Thr 85 90 95

Leu Lys Ile Pro Tyr Lys Tyr Glu His Asn Lys Ala His Ala Gln Leu

100 105 110

Val Arg Glu Val Asp Val Glu Lys Val Ser Ala Phe Glu Asn Pro Tyr 115 -Val Asp Ala Ile Lys Ser Leu Trp Asn Asp Pro Gly Ile Gln Glu Cys Tyr Asp Arg Arg Glu Tyr Gln Leu Ser Asp Ser Thr Lys Tyr Tyr Leu Asn Asp Leu Asp Arg Val Ala Asp Pro Ser Tyr Leu Pro Thr Gln Gln Asp Val Leu Arg Val Arg Val Pro Thr Thr Gly Ile Ile Glu Tyr Pro Phe Asp Leu Gln Ser Val Ile Phe Arg Met Val Asp Val Gly Gly Gln Arg Ser Glu Arg Arg Lys Trp Ile His Cys Phe Glu Asn Val Thr Ser Ile Met Phe Leu Val Ala Leu Ser Glu Tyr Asp Gln Val Leu Val Glu Ser Asp Asn Glu Asn Arg Met Glu Glu Ser Lys Ala Leu Phe Arg Thr Ile Ile Thr Tyr Pro Trp Phe Gln Asn Ser Ser Val Ile Leu Phe Leu Asn Lys Lys Asp Leu Leu Glu Glu Lys Ile Met Tyr Ser His Leu Val Asp Tyr Phe Pro Glu Tyr Asp Gly Pro Gln Arg Asp Ala Gln Ala Ala Arg Glu Phe Ile Leu Lys Met Phe Val Asp Leu Asn Pro Asp Ser Asp Lys Ile Ile Tyr Ser His Phe Thr Cys Ala Thr Asp Thr Glu Asn Ile Arg Phe Val Phe Ala Ala Val Lys Asp Thr Ile Leu Gln Leu Asn Leu Lys Glu Tyr Asn Leu Val

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Glu Ser Gly Lys Ser Thr Phe Ile Lys Gln Met Arg Ile Ile His Gly 50 55 60

Ser Gly Tyr Ser Asp Glu Asp Lys Arg Gly Phe Thr Lys Leu Val Tyr 65 70 75 80

Gln Asn Ile Phe Ser Ala Met Gln Ala Met Ile Arg Ala Met Glu Thr 85 90 95

Leu Lys Ile Pro Tyr Lys Tyr Glu His Asn Lys Gly His Ala Leu Leu 100 105 110

Val Arg Glu Val Asp Val Glu Lys Val Ala Ser Phe Glu Asn Pro Tyr 115 120 125

Val Asp Ala Ile Lys Tyr Leu Trp Asn Asp Pro Gly Ile Gln Glu Cys 130 135 140

Tyr Asp Arg Arg Glu Tyr Gln Leu Ser Asp Ser Thr Lys Tyr Tyr 145 150 155 160

Leu Asn Asp Leu Asp Arg Ile Ala Thr His Gly Tyr Leu Pro Thr Gln
165 170 175

Gln Asp Val Leu Arg Val Arg Val Pro Thr Thr Gly Ile Ile Glu Tyr 180 185 190

Pro Phe Asp Leu Gln Ser Val Ile Phe Arg Met Val Asp Val Gly Gly 195 200 205



Gln Arg Ser Glu Arg Arg Lys Trp Ile His Cys Phe Glu Asn Val Thr 210 215. 220

Ser Ile Met Phe Leu Val Ala Leu Ser Glu Tyr Asp Gln Val Leu Val 225 230 235 240

Glu Ser Asp Asn Glu Asn Arg Met Glu Glu Ser Lys Ala Leu Phe Arg 245 250 255

Thr Ile Ile Thr Tyr Pro Trp Phe Gln Asn Ser Ser Val Ile Leu Phe 260 265 270

Leu Asn Lys Lys Asp Leu Leu Glu Glu Lys Ile Met Tyr Ser His Leu 275 280 285

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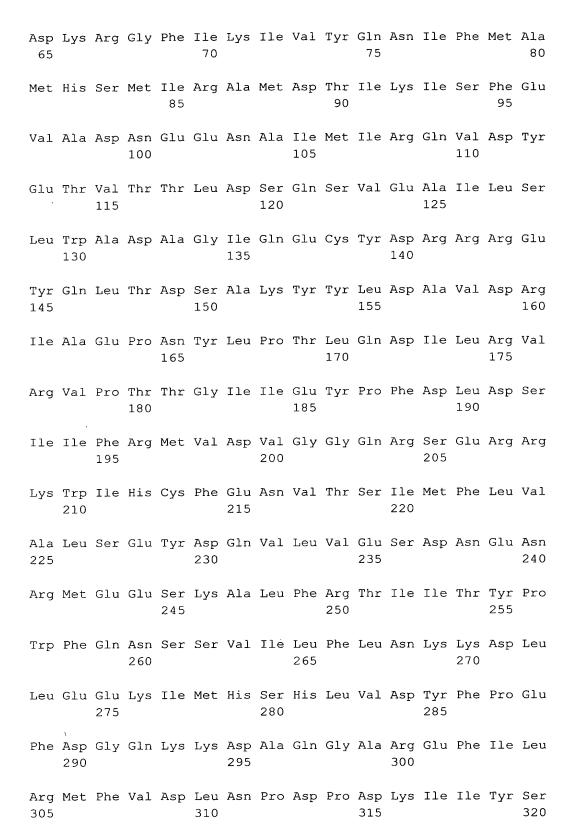
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35 40 45

Phe Ile Lys Gln Met Arg Ile Ile His Gly Thr Gly Tyr Ser Glu Glu 50 55 60



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Glu Leu Lys Leu Leu Leu Gly Thr Gly Glu Ser Gly Lys Ser Thr 35 40 45

Phe Ile Lys Gln Met Arg Ile Ile His Gly Ala Gly Tyr Ser Asp Glu 50 55 60

Asp Lys Arg Ser His Ile Lys Ile Val Tyr Gln Asn Ile Phe Met Ala 65 70 75 80

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Asn Pro Ala Asn Arg Glu Asn Gly Asn Met Ile Arg Gln Ile Asp Tyr 100 105 110

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Leu Trp Asn Asp Asp Gly Ile Gln Glu Cys Tyr Asp Arg Arg Glu 130 135 140

Tyr Gln Leu Thr Asp Ser Ala Lys Tyr Tyr Leu Asp Ser Val Glu Arg 145 150 155 160

Ile Ser Gln Gln Asp Tyr Leu Pro Thr Leu Gln Asp Ile Leu Arg Val

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Arg Val Pro Thr Thr Gly Ile Ile Glu Tyr Pro Phe Asp Leu Asp Ser 180 185 190

Ile Ile Phe Arg Met Val Asp Val Gly Gly Gln Arg Ser Glu Arg Arg 195 200 205

Lys Trp Ile His Cys Phe Glu Asn Val Thr Ser Ile Met Phe Leu Val 210 215 220

Ala Leu Ser Glu Tyr Asp Gln Val Leu Val Glu Ser Asp Asn Glu Asn 225 230 235 240

Arg Met Glu Glu Ser Lys Ala Leu Phe Arg Thr Ile Ile Thr Tyr Pro $245 \hspace{1.5cm} 250 \hspace{1.5cm} 255 \hspace{1.5cm}$

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Phe Asp Gly Pro Lys Lys Glu Ala Ser Thr Ala Arg Glu Phe Ile Leu 290 295 300

Lys Met Phe Val Glu Leu Asn Pro Asp Pro Asp Lys Ile Ile Tyr Ser 305 310 315 320

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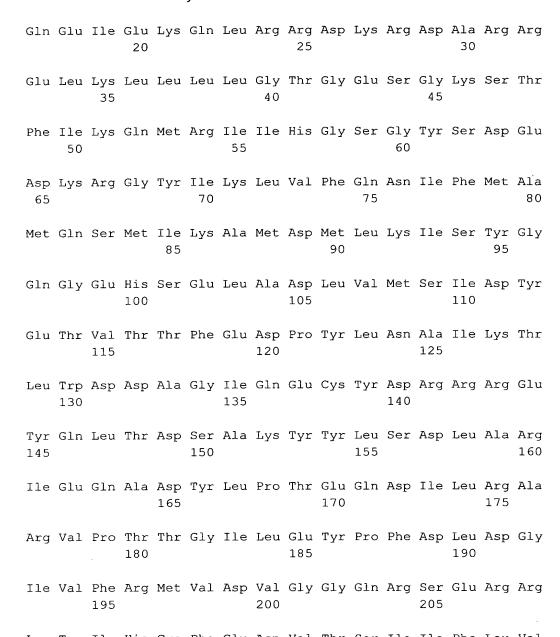
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Trp Phe Gln Asn Ser Ser Val Ile Leu Phe Leu Asn Lys Lys Asp Leu 260 265 270

Leu Glu Glu Lys Ile Met Tyr Ser His Leu Val Asp Tyr Phe Pro Glu 275 280 285

Tyr Asp Gly Pro Lys Gln Asp His Ala Ala Lys Gln Phe Val Leu 290 295 300

Lys Lys Tyr Leu Ala Cys Asn Pro Asp Pro Glu Arg Gln Cys Tyr Ser 305 310 315 320

His Phe Thr Thr Ala Thr Asp Thr Glu Asn Ile Lys Leu Val Phe Cys 325 330 335

Ala Val Lys Asp Thr Ile Met Gln Asn Ala Leu Lys Glu Phe Asn Leu 340 345 350

Gly

<210> 13

<211> 353

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Glu Leu Lys Leu Leu Leu Gly Thr Gly Glu Ser Gly Lys Ser Thr 35 40 45

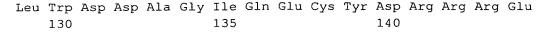
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85 90 95

Gln Gly Glu His Ser Glu Leu Ala Asp Leu Val Met Ser Ile Asp Tyr 100 105 110

Glu Thr Val Thr Thr Phe Glu Asp Pro Tyr Leu Asn Ala Ile Lys Thr 115 120 125



Tyr Gln Leu Thr Asp Ser Ala Lys Tyr Tyr Leu Lys Asp Leu Asp Arg 145 150 155 160

Val Ala Gln Pro Ala Tyr Leu Pro Thr Glu Gln Asp Ile Leu Arg Val 165 170 175

Arg Val Pro Thr Thr Gly Ile Ile Glu Tyr Pro Phe Asp Leu Glu Glu 180 185 190

Ile Arg Phe Arg Met Val Asp Val Gly Gly Gln Arg Ser Glu Arg Arg 195 200 205

Lys Trp Ile His Cys Phe Glu Asn Val Thr Ser Ile Ile Phe Leu Val 210 215 220

Ala Leu Ser Glu Tyr Asp Gln Ile Leu Phe Glu Ser Asp Asn Glu Asn 225 230 235 240

Arg Met Glu Glu Ser Lys Ala Leu Phe Arg Thr Ile Ile Thr Tyr Pro 245 250 255

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Tyr Asp Gly Pro Gln Arg Asp Ala Ile Thr Ala Arg Glu Phe Ile Leu 290 295 300

Arg Met Phe Val Asp Leu Asn Pro Asp Ser Glu Lys Ile Ile Tyr Ser 305 310 315 320

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<212> PRT

<213> Homarus americanus

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Ile Ala Ala Lys Asp Tyr Val Ser Thr Leu Gln Asp Ile Leu Arg Val

165 170 175

Arg Ala Pro Thr Thr Gly Ile Ile Glu Tyr Pro Phe Asp Leu Glu Glu 180 185 190

Ile Arg Phe Arg Met Val Asp Val Gly Gly Gln Arg Ser Glu Arg Arg 195 200 205

Lys Trp Ile His Cys Phe Glu Asn Val Thr Ser Ile Ile Phe Leu Val 210 215 220

Ala Leu Ser Glu Tyr Asp Gln Ile Leu Phe Glu Ser Asp Asn Glu Asn

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Leu Glu Glu Lys Ile Met Tyr Ser His Leu Val Asp Tyr Phe Pro Glu 275 280 285

Tyr Asp Gly Pro Arg Lys Asp Ala Ile Ala Ala Arg Glu Phe Ile Leu 290 295 300

Arg Met Phe Val Glu Leu Asn Pro Asp Pro Glu Lys Ile Ile Tyr Ser 305 310 315 320

His Phe Thr Cys Ala Thr Asp Thr Glu Asn Ile Arg Phe Val Phe Ala 325 330 335

Ala Val Lys Asp Thr Ile Leu Gln Leu Asn Leu Lys Glu Tyr Asn Leu 340 345 350

Val

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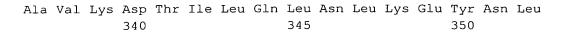
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Glu Leu Lys Leu Leu Leu Gly Thr Gly Glu Ser Gly Lys Ser Thr
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Phe Ile Lys Gln Met Arg Ile Ile His Gly Gln Gly Tyr Ser Asp Asp 50 55 60

Asp Lys Lys Ser Tyr Ile Lys Leu Val Tyr Gln Asn Ile Ile Met Ala 65 70 75 80





Val

<210> 16

<211> 354

<212> PRT

<213> Loligo forbesi

<400> 16

Met Ala Cys Cys Leu Ser Glu Glu Ala Lys Glu Gln Lys Arg Ile Asn
1 5 10 15

Gln Glu Ile Glu Lys Gln Leu Arg Arg Asp Lys Arg Asp Ala Arg Arg 20 25 30

Glu Leu Lys Leu Leu Leu Gly Thr Gly Glu Ser Gly Lys Ser Thr 35 40 45

Phe Ile Lys Gln Met Arg Ile Ile His Gly Ser Gly Tyr Ser Glu Glu 50 55 60

Asp Arg Lys Gly Phe Glu Lys Ile Val Tyr Gln Asn Ile Phe Ser Ala 65 70 75 80

Ile Gln Thr Leu Ile Ala Ala Met Glu Thr Leu Ser Leu Glu Tyr Lys 85 90 95

Asp Pro Ser Asn Asn Glu His Ala Glu Phe Leu Asn Ser Ile Asp Ala 100 105 110

Asp Ser Ala Asp Ile Phe Glu Asp Gly His Val Thr Ala Ile Lys Gly
115 120 125

Cys Trp Thr Asp Pro Gly Met Gln Glu Cys Tyr Asp Arg Arg Glu 130 135 140

Tyr Gln Leu Thr Asp Ser Ala Lys Tyr Tyr Leu Asp Asp Val Glu Arg 145 150 155 160

Ile His Glu Pro Gly Tyr Ile Pro Thr Leu Gln Asp Ile Leu Arg Val 165 170 175

Arg Val Pro Thr Thr Gly Ile Ile Glu Tyr Pro Phe Asp Leu Tyr Ser 180 185 190 Ile Ile Phe Arg Met Val Asp Val Gly Gly Gln Arg Ser Glu Arg Arg 195 200 205

Lys Trp Ile His Cys Phe Glu Asn Val Thr Ser Ile Met Phe Leu Val 210 220

Ala Leu Ser Glu Tyr Asp Gln Val Leu Val Glu Ser Asp Asn Glu Glu 225 230 235 240

Asn Arg Met Glu Glu Ser Lys Ala Leu Phe Arg Thr Ile Ile Thr Tyr 245 250 255

Pro Trp Phe Gln Asn Ser Ser Val Ile Leu Phe Leu Asn Lys Lys Asp 260 265 270

Leu Leu Glu Glu Lys Ile Met Thr Ser His Leu Ala Asp Tyr Phe Pro . 275 280 285

Asp Tyr Asp Gly Pro Lys Cys Asp Tyr Glu Ala Ala Arg Glu Phe Met 290 295 300

Met Asp Ser Tyr Met Asp Leu Asn Glu Asp Lys Glu Lys Met Leu Tyr 305 310 315 320

Tyr His Tyr Thr Cys Ala Thr Asp Thr Glu Asn Ile Arg Phe Val Phe 325 330 335

Ala Ala Val Lys Asp Thr Ile Leu Gln Leu Asn Leu Lys Glu Tyr Asn 340 345 350

Leu Val

<210> 17

<211> 355

<212> PRT

<213> Caenorhabditis elegans

<400> 17

Met Ala Cys Cys Leu Ser Glu Glu Ala Arg Glu Gln Lys Arg Ile Asn
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Gln Glu Ile Glu Lys Gln Leu Gln Arg Asp Lys Arg Asn Ala Arg Arg
20 25 30

Glu Leu Lys Leu Leu Leu Gly Thr Gly Glu Ser Gly Lys Ser Thr

35 40 45

Phe Ile Lys Gln Met Arg Ile Ile His Gly Gln Gly Tyr Ser Glu Glu 50 55 60 Asp Lys Arg Ala His Ile Arg Leu Val Tyr Gln Asn Val Phe Met Ala 65 Ile Gln Ser Met Ile Arg Ala Met Asp Thr Leu Asp Ile Lys Phe Gly 85 90 Asn Glu Ser Glu Glu Leu Gln Glu Lys Ala Ala Val Val Arg Glu Val 100 105 Asp Phe Glu Ser Val Thr Ser Phe Glu Glu Pro Tyr Val Ser Tyr Ile 120 Lys Glu Leu Trp Glu Asp Ser Gly Ile Gln Glu Cys Tyr Asp Arg Arg 130 135 140 Arg Glu Tyr Gln Leu Thr Asp Ser Ala Lys Tyr Tyr Leu Ser Asp Leu 150 155 160 145 Arg Arg Leu Ala Val Pro Asp Tyr Leu Pro Thr Glu Gln Asp Ile Leu 170 165 Arg Val Arg Val Pro Thr Thr Gly Ile Ile Glu Tyr Pro Phe Asp Leu 180 185 Glu Gln Ile Ile Phe Arg Met Val Asp Val Gly Gly Gln Arg Ser Glu 200 Arg Arg Lys Trp Ile His Cys Phe Glu Asn Val Thr Ser Ile Met Phe 210 Leu Val Ala Leu Ser Glu Tyr Asp Gln Val Leu Val Glu Cys Asp Asn 225 230 235 240 Glu Asn Arg Met Glu Glu Ser Lys Ala Leu Phe Arg Thr Ile Ile Thr 245 250 Tyr Pro Trp Phe Thr Asn Ser Ser Val Ile Leu Phe Leu Asn Lys Lys 260 265 Asp Leu Leu Glu Glu Lys Ile Leu Tyr Ser His Leu Ala Asp Tyr Phe 280

Pro Glu Tyr Asp Gly Pro Pro Arg Asp Pro Ile Ala Ala Arg Glu Phe

290 295 300

Ile Leu Lys Met Phe Val Asp Leu Asn Pro Asp Ala Asp Lys Ile Ile 305 310 315 320

Tyr Ser His Phe Thr Cys Ala Thr Asp Thr Glu Asn Ile Arg Phe Val 325 330 335

Phe Ala Ala Val Lys Asp Thr Ile Leu Gln His Asn Leu Lys Glu Tyr 340 345 350

Asn Leu Val

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<211> 355

<212> PRT

<213> Geodia cydonium

<400> 18

Met Ser Cys Leu Leu Ser Glu Glu Glu Arg Leu Gln Lys Arg Ile Asn
1 5 10 15

Thr Arg Ile Asn Arg Glu Leu Gln Arg Asp His Lys Asp Ala Lys Lys
20 25 30

Glu Ile Lys Leu Leu Leu Gly Thr Gly Glu Ser Gly Lys Ser Thr
35 40 45

Phe Ile Lys Gln Met Arg Ile Ile His Gly Lys Gly Tyr Ser Lys Gln 50 55 60

Asp Cys Leu Glu Tyr Lys Asn Leu Val Phe Arg Asn Ile Leu Met Ser 65 70 75 80

Met His Ser Met Leu Gln Ala Thr Ala Glu Leu Lys Ile Ala Tyr Ile 85 90 95

Asp Pro Asp Ala Gln Arg His Val Gln Leu Leu Met Ala Leu Arg Pro
100 105 110

Glu Thr Ala Gln Ser Leu Gly Gly Glu Thr Cys Glu Ala Ile Arg Lys
115 120 125

Leu Trp Gln Asp Ala Gly Val Gln Glu Cys Tyr Gln Arg Arg Asn Glu 130 135 140



Tyr Gln Leu Ser Asp Ser Thr Lys Tyr Tyr Leu Asp Asp Leu Pro Arg 145 150 155 160

Ile Ser Ser Asn Asp Tyr Val Pro Thr Thr Gln Asp Val Leu Arg Val
165 170 175

Arg Val Pro Thr Thr Gly Ile Asn Glu Tyr Pro Phe Thr Ile Asn Lys
180 185 190

Ile Ile Phe Lys Met Val Asp Val Gly Gly Gln Arg Ser Glu Arg Arg 195 200 205

Lys Trp Ile His Cys Phe Asp His Val Thr Ser Val Met Phe Leu Val 210 215 220

Ala Ile Ser Glu Tyr Asp Gln Ile Leu Val Glu Ala Asp Ser Arg Val 225 230 235 240

Asn Arg Met Val Glu Ser Leu His Leu Phe Asn Thr Ile Ile Ser Tyr 245 250 255

Pro Trp Phe Asn Lys Ser Ser Ile Ile Leu Phe Leu Asn Lys Lys Asp 260 265 270

Leu Leu Glu Glu Lys Val Met His Ser His Leu Ile Asp Tyr Phe Glu 275 280 285

Glu Tyr Asp Gly Pro Lys Cys Asp His Val Ser Ala Arg Glu Ser Ile 290 295 300

Ala Lys Met Phe Ile Ser Ile Asn Asp Met Arg Ser Ala Asp Ile Tyr 305 310 315 320

Pro His Phe Thr Cys Ala Thr Asp Thr Glu Asn Ile Lys Phe Val Phe 325 330 335

Asp Val Val Lys Asn His Ile Leu Gln Gln His Ile Thr Glu Val Val 340 345 350

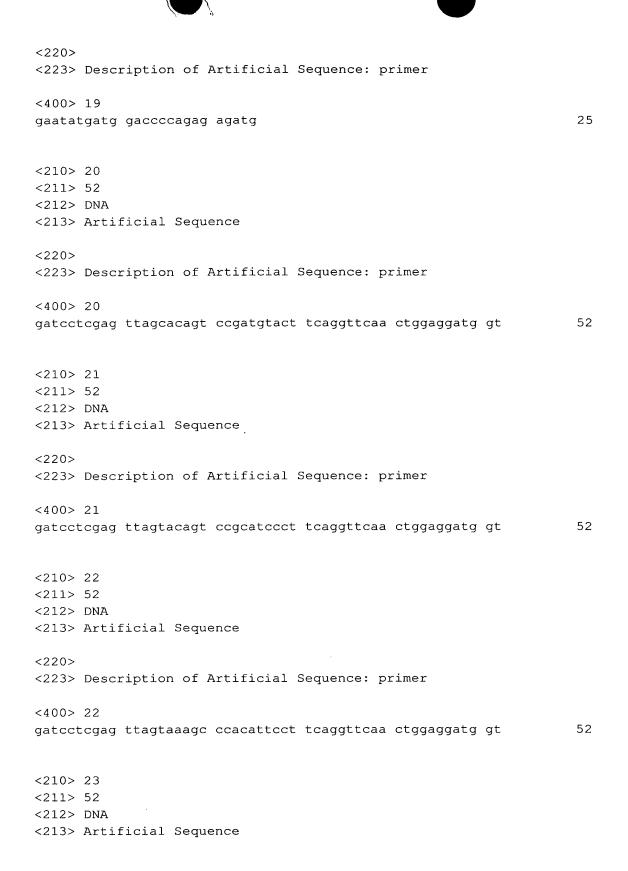
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Met Thr Leu Glu Ser Ile
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                                      10
Glu Tyr Asn Leu Val
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Tyr Ile Gly Leu Cys
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Gln Tyr Glu Leu Leu
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Glu Cys Gly Leu Tyr
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                                 25
             20
Glu Leu Lys Leu Leu Leu Gly Thr Gly Glu Ser Gly Lys Ser Thr
                             40
Phe Ile Lys Gln Met Arg Ile Ile His Gly Ser Gly Tyr Ser Asp Glu
                                              60
     50
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70

Asp Lys Arg Gly Tyr Ile Lys Leu Val Phe Gln Asn Ile Phe Met Ala

75





Met Gln Ser Met Ile Lys Ala Met Asp Met Leu Lys Ile Ser Tyr Gly 85 90 95

Gln Gly Glu His Ser Glu Leu Ala Asp Leu Val Met Ser Ile Asp Tyr 100 105 110

Glu Thr Val Thr Thr Phe Glu Asp Pro Tyr Leu Asn Ala Ile Lys Thr 115 120 125

Leu Trp Asp Asp Ala Gly Ile Gln Glu Cys Tyr Asp Arg Arg Glu
130 135 140

Val Ala Gln Pro Ala Tyr Leu Pro Thr Glu Gln Asp Ile Leu Arg Val 165 170 175

Arg Val Pro Thr Thr Gly Ile Ile Glu Tyr Pro Phe Asp Leu Glu Glu 180 185 190

Ile Arg Phe Arg Met Val Asp Val Gly Gly Gln Arg Ser Glu Arg Arg 195 200 205

Lys Trp Ile His Cys Phe Glu Asn Val Thr Ser Ile Ile Phe Leu Val 210 215 220

Ala Leu Ser Glu Tyr Asp Gln Ile Leu Phe Glu Ser Asp Asn Glu Asn 225 230 235 240

Arg Met Glu Glu Ser Lys Ala Leu Phe Arg Thr Ile Ile Thr Tyr Pro 245 250 255

Trp Phe Gln Asn Ser Ser Val Ile Leu Phe Leu Asn Lys Lys Asp Leu 260 265 270

Leu Glu Glu Lys Ile Met Tyr Ser His Leu Val Asp Tyr Phe Pro Glu 275 280 285

Tyr Asp Gly Pro Gln Arg Asp Ala Ile Thr Ala Arg Glu Phe Ile Leu 290 295 300

Arg Met Phe Val Asp Leu Asn Pro Asp Ser Glu Lys Ile Ile Tyr Ser 305 310 315 320

His Phe Thr Cys Ala Thr Asp Thr Glu Asn Ile Arg Phe Val Phe Ala 325 330 335





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- <211> 25
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gagcatcgat tacgagaccg ttacc

25

- <210> 45
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53